



City of Painesville, Ohio Vanadium Redox Battery Demonstration Program

Project Description

The City of Painesville, Ohio and its partners will demonstrate vanadium redox battery storage capacity at the 32 mega-watt, coal-fired Painesville Municipal Power (PMP) plant. Using stored power enables the facility to obtain the same daily output requirement in a more efficient manner with a lower carbon footprint. When fully implemented the plant will operate at a constant 26 MW, 80 percent of rated capacity. The long-term goal is to scale the battery system in stages, finally upgrading the facility to 100 percent storage capability. 1 MW of capacity with 6 to 8 hours of storage will be installed in the first phase. This capacity is sufficient for Painesville to optimize their power generation efficiency and allow American Municipal Power to level the peak demands of the system. An American Superconductor PM-3000 with a rated capacity of 1.1 MW and 1,120 amps will be used to provide AC/DC and voltage conversions. The battery will be constructed in two subsystems, each at 540 kW, providing a total capacity of 1.08 MW and 992 amps. The first subsystem will be comprised of 54, 10kW stacks and the second subsystem will have 18, 30 kW stacks. The subsystems will be arranged in parallel to maintain 1,008 volt operating conditions. Each stack subsystem will have their electrolyte flow into two 15,000 gallon polymer tanks at a rate of 2 gallons per minute. The battery components will be produced in the U.S., stacks will be assembled in Painesville, and installation will be in the PMP facility.

Goals/Objectives

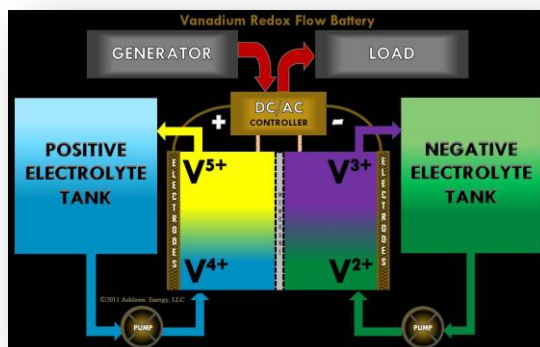
- Demonstrate power storage to provide spinning reserves in a grid environment with expansion to a larger scale
- Establish a template that can be introduced throughout the U.S.
- Provide data of the active use of storage to manage peak requirements in the most efficient manner

Key Milestones

- Battery 1 commissioning (April 2012)
- Facility Construction Complete (June 2012)
- Battery 2 commissioning (November 2012)
- Demonstration Period Begins (December 2012)

Benefits

- 29 job created with an additional 2,046 created by 2014
- Energy costs reduced
- Power quality improved
- Carbon emissions reduced by 24,000 metric tons



CONTACTS

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PARTNERS

Painesville Municipal Power
Ashlawn Energy LLC
V-Fuel Pty Ltd
American Municipal Power
Flanders Electric Inc
GPD Group Inc

PROJECT DURATION

03/1/2010–02/28/2014

BUDGET

Total Project Value

\$9,462,623

DOE/Non-DOE Share

\$4,243,570/\$5,219,053

EQUIPMENT

PM-3000 Power Converter/Controller
Precipitator Control System
Turbine Generators
Fuel Cell Stack Assembly
Storage Tanks

DEMONSTRATION STATES

Ohio

CID: OE0000233

Managed by the National Energy Technology Laboratory for the Office of Electricity Delivery and Energy Reliability